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# What can municipalities do to fight urban heat islands (UHI)?

## Follow-up note

POLICY LEARNING PLATFORM ONLINE MATCHMAKING SESSION

DATE: 31 October 2022, 10:00-11:30 CET

BENEFICIARY: Municipality of Oeiras

TOPICS: Urban heat islands, climate change, adaptation, mitigation, urban overheating, energy, methodology, data, cool materials, monitoring, integrated urban rehabilitation

### Main beneficiary & local stakeholders:

- Ana Isabel Beça, Municipality of Oeiras, Portugal
- Filipa Marrecas Ferreira, Municipality of Oeiras
- Paula Santos, Investment promotion – project funding manager, Municipality of Oeiras
- Sofia Casanova, Directorate of Urban Planning, Municipality of Oeiras
- Rita Brito e Abreu, CMOeiras, Environmental Department
- Filipa Grilo, Science Faculty, Lisbon University
- PhD Pedro Pinho, Science Faculty, Lisbon University

### Invited Peer experts:

- Dr Anna Laura Pisello, University of Perugia, Italy
- Katerina Danadiadou, Head of the Directorate of Urban Planning and Architectural Studies, Municipality of Thessaloniki, Greece
- Angeliki Chatzidimitriou, Dipl. Architect Engineer, MA (Env), PhD, Environmental Design Consultant, Post Doctoral Researcher, Thessaloniki, Greece
- Chrysanthi Kiskini, Head of the Department of European Union Projects, Regional Development Fund of Central Macedonia, Greece

### Interreg Europe Policy Learning Platform

- Katharina Krell, Thematic Expert Low Carbon Economy
- Eugénie Suplisson, Events expert
- Astrid Severin, Thematic Expert Environment & Resource Efficiency
- Elena Ferrario, Thematic Manager

### Interreg Europe Joint Secretariat

- Etienne Rodzinka-Verhelle, Policy Officer Environment and Resource efficiency

## OBJECTIVES OF THE MEETING

The Municipality of Oeiras (a highly innovative municipality located in the Lisbon metro area) is experiencing the detrimental effects of urban heat islands. Extreme heat waves cause increased mortality among vulnerable populations. Urban overheating increases biodiversity loss and exacerbates energy poverty. Oeiras works on a proposal of an adaptation plan (Plan for Climate Change Adaptation for Oeiras Municipality) for its territory that addresses the UHI problem and proposes many measures to mitigate this problem. Oeiras requested a matchmaking to meet and exchange with peers from other cities or regions who could share their experience about strategies to fight urban heat islands in their territories.

## SOME KEY TAKEAWAYS

- Cities exhibit their own microclimate and are typically warmer than the surrounding rural areas. Urban heat islands are a product of the rising temperatures: human activity, concrete, asphalt and pollution all drive up the temperature in a city by as much as five degrees compared to the countryside.
- A better term for Urban Heat Island effect is “urban over-heating” as it is non-ambiguously pointing to a problem (whereas urban heat island could be interpreted as something positive in cold climates).
- With increasing temperatures and more frequent intense and durable heat waves, the UHI intensity is increasing. Urban populations are more exposed and vulnerable to microclimate risky conditions, with health, economic and environmental consequences.
- Low income and less educated populations are most exposed to this risk, exacerbated by energy poverty.
- Two types of solutions exist to cope with urban overheating: mitigation and adaptation.
- The drivers of UHI are mostly anthropogenic.
- Good data acquisition is key at the outset of any bioclimatic remediation project. Data needs to be collected at multiple scales (regional, urban area, individual street canyon). It is important to combine remote sensing, weather station data and mobile measurements to understand and correctly map the microclimate in each street canyon.
- Several techniques can counter UHI: green and blue infrastructure (trees, green roofs and façades, other vegetation, soil, still and moving water elements), cool materials (paint and material for roofs and pavements), ventilation and smart clothing.
- Cool materials have high solar reflectance and high thermal emittance and are readily available on the market. Many of them are inexpensive and can include recycled materials. These materials play a key role for mitigating UHI and belong in the toolbox of urban planners and private developers.
- Thessaloniki applied many of the measures to fight UHI in the “Bioclimatic upgrading project of the wider Stock Exchange Square area”, a derelict downtown area in need of urban refurbishment.
- The project lasted 5 years: 3 years for a preparatory study and simulation, and 2 years for the actual implementation. 110.000 m<sup>2</sup> were covered with a total investment of 5.5 Million EUR from ERDF funds.
- The city mandated the study, done in a cooperation between the city, CRES (Greek Centre for Renewable Energy Sources) and private sector experts.
- Four types of interventions were combined: cool materials on all streets and pavements, increase of trees and vegetation, water evaporation on different levels, and fans for airflow enforcement. The expected combined effect of these measures is a surface temperature reduction of 10°C.
- Besides outdoor comfort benefits, the microclimate amelioration also enhances energy savings by reducing building cooling loads and presents an overall upgrading effect of the area in terms sustainable urban development and urban regeneration.

- Any urban regeneration project in areas affected by urban overheating should by default include measures presented above.
- Challenges persist for the responsible municipalities, e.g. due to procurement rules favouring the cheapest bid, which is not always helpful when procuring rather innovative concepts. Water elements have not always been working as expected. Any measure should reduce its own environmental impact (e.g. big fans to be powered by solar PV).

## FOLLOW UP ACTIONS

- Oeiras is interested in setting up an EU project on the topic and wishes to stay in touch with the peers.

## Agenda

10:00 CET (09:00 WET, 11:00 EET) 05 min.	Moderator: Katharina Krell, Thematic Expert Low-Carbon Economy Welcome, rationale of the online matchmaking session Introduction round: each participant briefly presents herself / himself
15 min.	Introduction to Oeiras municipality and the policy challenge: reducing the urban heat island effect Ana Isabel Beça, Municipality of Oeiras
15 min.	Approaches to fight UHI Dr Anna Laura Pisello, University of Perugia, Italy
10 min.	<ul style="list-style-type: none"> <li>• Follow-up questions</li> </ul>
15 min.	Presentation of Thessaloniki's strategy to fight UHI with practical examples from the "Bioclimatic upgrading project of the wider Stock Exchange Square area" Katerina Danadiadou, Head of the Directorate of Urban Planning and Architectural Studies, Municipality of Thessaloniki, and Angeliki Chatzidimitriou, Dipl. Architect Engineer, MA (Env), PhD, Environmental Design Consultant, Post Doctoral Researcher, Thessaloniki, Greece
10 min.	<ul style="list-style-type: none"> <li>• Follow-up questions</li> </ul>
15 min.	Discussion – ideas for future implementation of UHI counter measures at Oeiras
5 min.	Wrap up, take away messages and next steps Feedback survey <a href="https://www.surveymonkey.com/r/UHI-Oeiras">https://www.surveymonkey.com/r/UHI-Oeiras</a>